

REMARKS

This Amendment is in response to the Office Action dated June 13, 2005. In the Office Action, the Examiner rejected claims 1-6, 8-13, 15-25, and 27-29 under 35 U.S.C. § 103(a) as being unpatentable over Ishii et al., U.S. Patent No. 5,835,761 (hereinafter *Ishii*) in view of Reha et al., U.S. Patent No. 6,282,709 (hereinafter *Reha*).

No claim amendments are made herein. For the reasons set forth below, the Applicants respectfully request reconsideration and allowance of all pending claims.

Traversal of the Rejection of Claims under 35 U.S.C. § 103

Each of claims 1-6, 8-13, 15-25, and 27-29 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ishii* in view of *Reha*. To establish a *prima facie* case of obviousness, there must first be some suggestion or motivation to modify a reference or to combine references, and second be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. § 706.02(j) from *In Re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed device; and (2) whether the prior art would also have revealed that in so making, those of ordinary skill would have a reasonable expectation of success. Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the Applicants' disclosure. *Amgen v. Chugai Pharmaceutical*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991), *Fritsch v. Lin*, 21 USPQ2d 1731 (Bd. Pat. App. & Int'f 1991). An invention is non-obvious if the references fail not only to expressly disclose the claimed invention as a whole, but also to suggest to one of ordinary skill in

the art modifications needed to meet all the claim limitations. *Litton Industrial Products, Inc. v. Solid State Systems Corp.*, 755 F.2d 158, 164, 225 USPQ 34, 38 (Fed. Cir. 1985).

The examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. M.P.E.P. § 70602(j) from *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). Obviousness cannot be established by combining references without also providing evidence of the motivating force which would impel one skilled in the art to do what the patent applicant has done. M.P.E.P. § 2144 from *Ex parte Levensgood*, 28 USPQ2d 1300, 1302 (Bd. Pat. App. & Inter. 1993) (emphasis added by M.P.E.P.).

Claim 1 presently recites,

1. A method for updating an existing portion of platform firmware data, comprising:
writing updated firmware data that is to replace the existing portion of platform firmware data to a firmware storage device in which the existing portion of firmware data are stored; and

atomically modifying firmware configuration data in the firmware storage device to indicate the updated firmware data is to be used in place of the existing portion of platform firmware data that is being updated such that only the existing portion of platform firmware data are valid prior to the atomic modification of the firmware configuration data and only the updated firmware data are valid after the atomic modification to the firmware configuration data.

In support of the rejection of claim 1, the Examiner asserts *Ishii* discloses:

writing updated firmware data that is to replace the original portion of platform firmware data to a firmware storage device (col. 3 lines 22-27);

and atomically modifying firmware configuration data to indicate the updated firmware data is to be used in place of the original portion of platform firmware data that is being updated such that only all of the original portion of platform firmware data are valid prior to the atomic

modification of the firmware configuration data and only all of the updated firmware data are valid after the atomic modification to the firmware configuration data (col. 3 lines 22-55, col. 9 lines 30-67, and col. 10 lines 24-36).

The Examiner then states,

Ishii does not disclose writing updated version in which the existing portion of firmware data are stored. Reha et al discloses storing updated version in which the existing software are stored (col. 6 lines 5-15). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the teaching of Reha et al into Ishii to writing updated version in which the existing portion of firmware data are stored because one would want a simple way to compare the version of software.

Applicants respectfully assert that the teachings of *Reha* are irrelevant to the patentability of the current claims, and that the combination of *Ishii* and *Reha* fail all three prongs of the *In Re Vaeck* test for *prima facie* obviousness.

Reha concerns a software update manager that is used to update software on a computer. As stated in the Abstract, *Reha* discloses,

A method and apparatus for checking/updating existing software on a user's computer utilizes a graphical user interface (GUI). The GUI enables the user, without knowing what software exists on the computer, to download a text file from a remote server and check whether the software on the remote server is contained on the user's computer. The user can also download and automatically install a new or updated program via the GUI.

Notably, *Reha* provides an update method that updates *software*, not firmware. This has significant implications. First of all, access and execution of software is managed by an operating system, allowing software to be stored anywhere on a storage device, such as a disk drive. As stated in Col. 3, lines 47-55,

Software update manager 12 includes two main components, graphical user interface (GUI) 16 and software update library 18. In the exemplary embodiment, the software update manager 12 is configured as a Microsoft Windows™ compatible application program and computer system 100 is a typical PC. *However, the software update manager 12 can be designed to be compatible with any particular operating system software and any particular computer system 100, as described earlier.*

Under the conventional approach used by modern computer systems, an operating system is used to “host” software comprising applications in the like. It also may employ software device drivers to interface with various peripheral devices on the computer system, such as the video display driver software referenced in the Background Art section of *Reha*. The operating system also manages storage of the software in the form of one or more files, using an operating system file system. The operating system file system enables the operating system to store the application, and load the application for execution. The file system also enables other applications to access the software.

In further detail, an operating system, such as Microsoft Windows, enables software in the form of one or more files to be located anywhere on one or more storage devices configured to be employed for storing data under control of the operating system. Furthermore, multiple versions of software may be stored in different files on one or more storage devices accessible to the operating system, such as disk drives and the like. Notably, a firmware storage device may not be employed for storing software that is to run on an operating system. Rather, the firmware storage device is reserved for storing firmware, which typically comprises instructions and modules that are run prior to booting an operating system (primarily) (and thus must be run without the support of the operating system), and may employ BIOS run-time drivers and the like that are employed during operating system run-time that are accessed via a firmware-based run-time interface.

In sharp contrast, the location of firmware on a firmware storage device is critical to its operation. As the firmware is typically coded as a binary (data) module or modules, the addresses referenced in the module or modules are at fixed, pre-defined locations or offsets, meaning the module or modules must be located at pre-defined locations within the firmware storage device. Furthermore, when updating a version of firmware, there needs to be a mechanism to direct the execution path from the old

version of firmware to the new version of firmware, and that mechanism needs to be bullet proof. For this reason, the conventional scheme for updating firmware replaces the entire firmware image (absent the boot block), such that the location (address) of the first instruction of the updated firmware remains the same as before. However, under claimed embodiments of the present invention, firmware configuration information is atomically modified to indicate the updated firmware data is to be used in place of the existing firmware data being updated. This removes the restriction of having to replace the entire firmware image, increasing the flexibility of the firmware implementation.

The foregoing firmware update scheme becomes particularly difficult when the firmware storage device comprises flash memory, as claimed in claim 8. Under flash memory, it is not possible to “flip” a bit in both directions. An individual bit may only be flipped in one direction. Thus, to write new data to flash memory, one needs to erase (set or clear all the bits in) an entire block, and then flip selected bits in that block to reflect the updated data. In view of this consideration, it is imperative that there be some mechanism to return to the existing version of firmware if an update fails somewhere during the update process. For this reason, the atomic modification to the firmware configuration data is employed by embodiments of the claimed invention such that a single (i.e., atomic) change causes the platform to switch from using the former existing firmware data to the new updated data.

In view of the foregoing, it is clear that *Ishii* and *Reha*, alone or in combination, simply do not teach or suggest all of the elements and limitations of claim 1. Accordingly, the third prong of the *In Re Vaeck* test is failed, and thus the rejection of claim 1 over *Ishii* in view of *Reha* is improper and should be withdrawn.

There is also no motivation to combine the *Ishii* and *Reha* references, nor would there be any expectation of success. *Ishii* discloses a mechanism for updating BIOS (i.e. firmware). *Reha* discloses a mechanism for updating software that is accessed via an operating system. The considerations for updating software are very minor in

comparison to updating firmware. As discussed above, a software update may be located any where on a storage device. Since the operating system manages loading the software in memory for execution, the storage location of the software update is immaterial to its operation.

In further detail, *Ishii* discloses an information processing system capable of updating a BIOS programme without interrupting or stopping the operation of the system. Various embodiments for accomplishing this task are disclosed. However, each embodiment generally follows the same sequence. The updated BIOS programme is first written to a temporary storage area, which in the embodiment of Figure 5, for example is update program memory 48. Meanwhile, the original BIOS programme is stored in non-volatile BIOS memory 45. During initialization operations, the original BIOS programme in BIOS memory 45 is written to shadow RAM in main memory 44, as was a common practice at the time the *Ishii* patent application was filed. After a multi-tasking operating system (OS) is loaded, the OS is used to enable an updated BIOS program stored on an external medium (e.g., flexible disc 53), device, or network) to be copied to a temporary store (e.g., update program memory 48 in Figure 5 or first common memory 67a in the embodiment of Figure 15) on information processing system 41. The original BIOS program (stored in BIOS memory 45) is then subsequently replaced with the updated BIOS program under management of the OS.

Each embodiment disclosed by *Ishii* employs a pair of firmware storage devices and a separate memory switch unit 47. For instance, each of the embodiments of FIGs. 5, 11-14, 23, and 29-33 employ a recovery memory 46 and a BIOS memory 45, in addition to a separate update programme memory 48 and a memory switch unit 47. Each of the embodiments of FIGs. 15, and 19-22 employ a first common memory 67a and a second common memory 67b in combination with the memory switch unit 47.

It is clear that *Ishii* does not teach the element of "atomically modifying firmware configuration data in the firmware storage device to indicate the updated firmware data

is to be used in place of the existing portion of platform firmware data that is being updated such that only the existing portion of platform firmware data are valid prior to the atomic modification of the firmware configuration data and only the updated firmware data are valid after the atomic modification to the firmware configuration data.”

Ishii does not modify firmware configuration data in a firmware storage device to perform a similar operation. Rather, in the embodiments that employ update programme memory 48, the only configuration data that is changed is the BIOS update flag 50. In the embodiments that employ the common memories, the only configuration data that are changed pertain to programmes (either BIOS or recovery programmes) stored in an alternate common memory,

In sharp contrast to *Ishii*'s approach, the mechanism for identifying that the software has been updated is quite different than that employed by *Ishii* to identify that the BIOS programme has been updated. Under a typical operating system, information identifying the location of a current version of software is provided in a registry (e.g., the Windows registry used by Microsoft windows products), or an initialization file. Thus, to configure the change in which software version to use, a consummate change is made to a registry or initialization file entry. Each of the registry and initialization file is accessed by the operating system via its file system. Thus, the changes are made to operating system files, and not to any firmware configuration data.

One of ordinary skill in the art would have no expectation of success in combining the teachings of *Ishii* and *Reha* to obtain the invention of claim 1. As discussed above, the update mechanisms employed by *Ishii* and *Reha* aren't even to the same type of data (BIOS vs. Operating System hosted software). The update configuration mechanisms are entirely different. Importantly, the update mechanism employed by *Reha* is not available to the firmware sub-system of a computer system. Clearly, there would be no expectation of success.

In summary, it is clear that the claim element “writing updated firmware data that is to replace the existing portion of platform firmware data to a firmware storage device in which the existing portion of firmware data are stored” is not taught or suggested by the combination of *Ishii* and *Reha*, nor is there any motivation in either reference to combine the teachings of the references nor would there be any expectation of success. Accordingly, the rejection of claim 1 as being unpatentable over *Ishii* in view of *Reha* is improper and should be withdrawn.

With respect to the allowability of independent claim 9, this claim recites similar elements and limitations to claim 1:

9. A method for updating a plurality of existing platform firmware files, comprising:

creating a temporary file in a firmware storage device in which the existing platform firmware files are stored;

writing data corresponding to a plurality of updated platform firmware files comprising new versions of the plurality of existing platform firmware files to the temporary file; and

modifying platform firmware file configuration information in the platform storage device to indicate that the updated platform firmware files are to be used in place of the existing platform firmware files such that only the existing platform firmware files or only the updated platform firmware files are valid at any point in time during an update process. (Emphasis added)

It is clear from the foregoing argument in support of the patentability of amended claim 1 that *Ishii* does not store both existing platform firmware files and updated platform firmware files in the same firmware storage device, nor does *Raha* store any data in a firmware storage device. Rather, each of the *Ishii* embodiments, the existing BIOS programme and updated BIOS programme are stored in separate storage devices (when both versions of the BIOS programme are actually stored on the computer

system at the same time), while Raha's update information pertains to updated software and is stored in a file accessed by an operating system.

Furthermore, *Ishii* clearly does not disclose updating multiple platform firmware files. Rather, *Ishii* discloses updating a single file (the BIOS programme). *Ishii* also does not employ any platform firmware file configuration information for multiple platform firmware files. The only configuration information *Ishii* employs are flags corresponding to the state of the update of the entire BIOS programme. Accordingly, the rejection of independent claim 9 as unpatentable over *Ishii* in view of *Reha* is improper and should be withdrawn.

Independent claim 18 is a Beauregard claim (machine-readable medium) claiming software/firmware for performing the method of amended claim 1. Accordingly, claim 18 is patentable over the cited art for similar reasons presented above in support of allowance of independent claim 1. Similarly, Independent claim 21 is a Beauregard claim claiming software/firmware for performing the method of amended claim 9. Accordingly, claim 21 is patentable over the cited art for similar reasons presented above in support of allowance of independent claim 9.

Overall, none of the references singly or in any motivated combination disclose, teach, or suggest what is recited in the independent claims. Thus, given the above amendments and accompanying remarks, independent claims 1, 9, 18, and 21 are now in condition for allowance. The dependent claims that depend directly or indirectly on these independent claims are likewise allowable based on at least the same reasons and based on the recitations contained in each dependent claim.

If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to the allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 292-8600.

Charge Deposit Account

Please charge our Deposit Account No. 02-2666 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

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